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(54) Title: UV CURABLE COATING COMPOSITION AND OPTICAL RECORDING MEDIUM USING THE SAME

(57) Abstract: A UV curable coating composition for an ink-receiving layer that is required for ink jet printing and an optical recording medium having the ink-receiving layer formed by the UV curable coating composition are provided. The UV curable coating composition includes a (meth)acrylate monomer, a (meth)acrylate oligomer, N-vinyl-2-pyrrolidone, and inorganic and organic pigments. An ink-receiving layer formed by the UV curable coating composition shows excellent adhesion to substrates, ink absorption and adsorption, drying efficiency, and water resistance in ink jet printing. Therefore, high quality recording media can be formed.

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## UV CURABLE COATING COMPOSITION AND OPTICAL RECORDING MEDIUM USING THE SAME

### 5    Technical Field

The present invention relates to a UV curable coating composition and an optical recording medium, and more particularly, to a UV curable coating composition for use in forming an ink-receiving layer that is needed for ink jet printing and an optical recording medium coated with  
10    the UV curable coating composition.

### Background Art

Water soluble ink used for ink jet printing is sprayed onto a recording medium through a nozzle of a printer head and spontaneously dried and fixed to display characters or images on the recording medium.

15    Recently, ink jet printing methods for printing characters and images on a variety of recording media using such water soluble ink have been widely used for the advantages of high economical value, easy coloration, high-speed printing, low-noise generation, and sharp output of characters and images. Ink jet printing can be carried out with  
20    general printing paper, but preferably with recording media including paper specified for ink jet printing to improve printing characteristics, such as the resolution of the printed characters and images, wherein the recording media specified for ink jet printing have on their surface an ink-receiving layer capable of sufficiently absorbing water soluble ink to  
25    improve the sharpness of printed images.

Paper can be easily applied as a recording medium for ink jet printing because it has an inherent hydrophilic surface, and deposition of an ink-receiving layer thereon is also easy. However, it is difficult to apply the ink jet printing method on the surface of glass, metal, and

plastic media which have hydrophobic properties. To enable ink jet printing of recording media having no ink-absorption surface, many attempts to form an ink-receiving layer on such recording media have been tried. For example, Korea Laid-open Publication No. 99-29618  
5 discloses a recording medium having an ink-receiving layer containing hydrophilic resin and a cationic compound. However, this recording medium has a weak wet-endurance, and the surface of the recording medium remains sticky such that the output quality of data degrades. International Publication No. 99/16835 discloses a radioactive ray  
10 curable compound including single and multifunctional (meth)acrylic monomers and an ink-receiving layer including ink-absorptive inorganic or organic filler. This disclosure is limited by slow drying rate and poor resolution.

#### 15 Disclosure of the Invention

It is a first object of the present invention to provide a UV curable coating composition with improved adhesion to a substrate, improved absorptive and adsorptive properties of water soluble ink used for ink jet printing, and improved drying efficiency and water resistance.

20 It is a second object of the present invention to provide an optical recording medium using the above coating composition.

To achieve the first object of the present invention, there is provided a UV curable coating composition comprising 100 parts by weight (meth)acrylate monomer, 150-250 parts by weight (meth)acrylate  
25 oligomer, and 10-100 parts by weight N-vinyl-2-pyrrolidone.

It is preferable that the UV curable coating composition further comprises 30-150 parts by weight an inorganic pigment and 50-150 parts by weight an organic pigment, based on 100 parts by weight the (meth)acrylate monomer.

30 Mono- or multi-functional (meth)acrylate monomers can be used in

the present invention without limitations. Suitable (meth)acrylate monomers include alkyl(meth)acrylate, (meth)acrylic acid, (meth)acrylonitrile, (meth)acrylamide, N-substituted (meth)acrylamide, N-methylol(meth)acrylamide, hydroxyethyl(meth)acrylate, carboxyethyl (meth)acrylate, (meth)acryloylmorpholine, ethylene glycol mono(meth) acrylate, diethylene glycol mono(meth)acrylate, polyethylene glycol mono(meth)acrylate, dimethylaminopropyl(meth)acrylamide, tetrahydrofurfuryl(meth)acrylate, ethylene glycol di(meth)acrylate, diethylene glycol di(meth)acrylate, polyethyleleglycol di(meth)acrylate, 1,6-hexane glycol di(meth)acrylate, pentaerythritol tetra(meth)acrylate, pentaerythritol (meth)acrylate, trimethylolpropane tri(meth)acrylate, and trimethylolpropane di(meth)acrylate. Also, mixtures of at least two of the materials listed above can be used.

The alkyl(meth)acrylate may be methyl(meth)acrylate, ethyl(meth)acrylate, propyl(meth)acrylate, n-butyl(meth)acrylate, or t-butyl(meth)acrylate. More preferably, monomers having hydrophilic groups such as hydroxyl group, carboxyl group, amino group, morpholino group, and tetrahydrofurfuryl group are used.

More preferably, the (meth)acrylate monomer is alkyl(meth) acrylate, hydroxyethyl(meth)acrylate, carboxyethyl(meth) acrylate, diethylene glycol mono(meth)acrylate, ethylene glycol mono(meth) acrylate, tetrahydrofurfuryl(meth)acrylate, or polyethylene glycol di(meth) acrylate.

The (meth)acrylate monomer is used as a diluent for easy handling of the coating composition.

Mono- or multi-functional (meth)acrylate oligomers can used in the UV curable coating composition according to the present invention without limitations. Suitable (meth)acrylate oligomers include alkyl(meth)acrylate oligomer, (meth)acrylic acid oligomer, (meth) acrylonitrile oligomer, (meth)acrylamide oligomer, N-substituted (meth)

acrylamide oligomer, N-methylol(meth)acrylamide oligomer, hydroxyethyl (meth)acrylate oligomer, carboxyethyl(meth)acrylate oligomer, (meth) acryloylmorpholine oligomer, ethylene glycol mono(meth)acrylate oligomer, diethylene glycol mono(meth)acrylate oligomer, polyethylene glycol mono(meth)acrylate oligomer, dimethylaminopropyl(meth) acrylamide oligomer, tetrahydrofurfuryl(meth)acrylate oligomer, ethylene glycol di(meth)acrylate oligomer, diethylene glycol di(meth)acrylate oligomer, polyethylene glycol di(meth)acrylate oligomer, 1,6-hexane glycol di(meth)acrylate oligomer, pentaerythritol tetra(meth)acrylate oligomer, pentaerythritol (meth)acrylate oligomer, trimethylolpropane tri(meth)acrylate oligomer, and trimethylolpropane di(meth)acrylate oligomer. Also, mixtures of at least two of the materials listed above can be used.

The alkyl(meth)acrylate oligomer may be methyl(meth)acrylate oligomer, ethyl(meth)acrylate oligomer, propyl(meth)acrylate oligomer, n-butyl(meth)acrylate oligomer, or t-butyl(meth)acrylate oligomer. More preferably, oligomers having hydrophilic groups such as hydroxyl group, carboxyl group, amino group, morpholino group, and tetrahydrofurfuryl group are used.

More preferably, the (meth)acrylate oligomer is alkyl(meth) acrylate oligomer, hydroxyethyl(meth)acrylate oligomer, carboxyethyl (meth)acrylate oligomer, diethylene glycol mono(meth) acrylate oligomer, ethylene glycol mono(meth)acrylate oligomer, tetrahydrofurfuryl(meth) acrylate oligomer, or polyethylene glycol mono(meth)acrylate oligomer.

The (meth)acrylate oligomer used in the present invention acts as a binder of a function material to an object. In the UV curable coating composition, it is preferable that the (meth)acrylate oligomer is added in an amount of 150-250 parts by weight based on 100 parts by weight the (meth)acrylate monomer. If the amount of the (meth)acrylate oligomer is less than 150 parts by weight, ink bleeding is likely to occur. If the

amount of the (meth)acrylate oligomer exceeds 120 parts by weight, drying properties become poor.

Preferably, the (meth)acrylate oligomer has an average molecular weight of 500-10,000, and more preferably 700-5,000.

5       The N-vinyl-2-pyrrolidone used in the UV curable coating composition according to the present invention makes a pigment and oligomers miscible in the coating composition and increases UV curing rate. The N-vinyl-2-pyrrolidone also acts to increase the adhesion of a dye. It is preferable that the N-vinyl-2-pyrrolidone is used in an amount  
10 of 10-100 parts by weight based on 100 parts by weight the (meth)acrylate monomer. If the amount of the N-vinyl-2-pyrrolidone exceeds 100 parts by weight, the viscosity of the coating composition becomes too low. If the amount of the N-vinyl-2-pyrrolidone is less than 10 parts by weight, the UV curing rate becomes slow.

15       Any inorganic pigment can be used in the UV curable coating composition without limitations. Suitable inorganic pigments include alumina, silica gel, silica-alumina, talc, diatomaceous earth, calcium carbonate, calcium sulfate, zeolite, kaolin, barium sulfate, titanium dioxide, zinc oxide, zinc sulfate, zinc carbonate, saturn white, aluminum  
20 silicate, calcium silicate, magnesium silicate, synthetic amorphous silica, colloidal silica, colloidal alumina, pseudoboehmite, aluminum hydroxide, lithopone, magnesium carbonate, and magnesium hydroxide. Also, mixtures of at least two of the inorganic pigments listed above can be used. Preferably, the inorganic pigment is used in an amount of  
25 30-150 parts by weight based upon 100 parts by weight the (meth)acrylate monomer. If the amount of the inorganic pigment is less than 30 parts by weight, the degree of water absorption decreases. If the amount of the inorganic pigment exceeds 150 parts by weight, the viscosity of the coating composition become too high. A mixture of kaolin  
30 and calcium carbonate is more preferred than the other inorganic

pigments listed above.

Any organic pigment can be used in the UV curable coating composition according to the present invention without limitations. Suitable organic pigments include styrene-based plastic pigment, acrylic plastic pigment, polyethylene, microcapsule, urea resin, melamine resin.

Also, mixtures of at least two of the organic pigments listed above can be used. It is preferable that the organic pigment is used in an amount of 50-150 parts by weight based on 100 parts by weight the (meth)acrylate monomer. If the amount of the organic pigment is less than 50 parts by weight, the degree of water absorption decreases. If the amount of the organic pigment exceeds 150 parts by weight, the viscosity of the coating composition becomes too high. Polymethylene urea is more preferred than the other organic pigments listed above.

It is preferable that the UV curable coating composition comprises a photopolymerization initiator because it is polymerized by UV radiation. Suitable photopolymerization initiators include photopolymerization initiators, widely used in the art without limitations, for example,  $\alpha$ -hydroxyketone, acetophenone, benzoin, benzophenone, and thioxanthone. Also, mixtures of at least two of the materials listed above can be used as a photopolymerization initiator. It is preferable that the photopolymerization initiator is used in an amount of 5-30 parts by weight based on 100 parts by weight the (meth)acrylate monomer. If the amount of the photopolymerization initiator is less than 5 parts by weight, the UV curing rate decreases. If the amount of the photopolymerization initiator exceeds 30 parts by weight, the UV curable coating composition is excessively cured.  $\alpha$ -Hydroxyketone is more preferable than the other photopolymerization initiators listed above.

In the preparation of the UV curable coating composition according to the present invention, a surfactant or a dispersing agent is preferably added to decrease the attraction between constituent

compounds so that the pigments are smoothly dispersed in the coating composition with increased stability of the coated layer. Suitable surfactants or dispersing agents include modified polyacrylate, acidic polyester polyamide, unsaturated polyamide, carboxylate, and hydroxy functional unsaturated modified carboxylic acid. It is preferable that the surfactant or the dispersing agent is used in an amount of 5-50 parts by weight based on 100 parts by weight the (meth)acrylate monomer. If the amount of the surfactant or the dispersing agent is less than 5 parts by weight, constituent dispensability becomes poor. If the amount of the surfactant or the dispersing agent exceeds 50 parts by weight, ink functionality degrades.

To enhance hydrophilicity, a cross-linking agent may be further added to the UV curable coating composition according to the present invention. Suitable cross-linking agents include methylolmelamine, methylolurea, methylolhydroxypropylene urea, and isocyanate.

To enhance other physical properties, other additives such as a light resistance enhancer, a dye/pigment fixing agent, a thickening agent, a flowability enhancer, an antifoaming agent, a foam inhibitor, a releasing agent, a foaming agent, a permeating agent, a coloring dye, a fluorescent brightener, an anti-staling agent, a dehydrating agent, or a film forming agent can be added selectively and mixed with the UV curable coating composition.

In a preferred embodiment, coating of the UV curable coating composition according to the present invention is followed by UV radiation to polymerize and cure the coated UV curable coating composition. The UV curable coating composition according to the present invention also can be cured by electron beams or by heat followed by UV radiation. It is preferable that UV radiated onto a coated layer has an intensity of 100-500W/inch<sup>2</sup> at a wavelength of 250-400 nm. A mercury lamp, which is widely used in the art, can be



used as a UV source. The constituents of the UV curable coating composition according to the present invention are radically polymerized and cured by UV radiation.

5 An ink-receiving layer can be formed by coating the UV curable coating composition according to the present invention on a surface of a substrate and radiating UV onto the coated UV curable coating composition. The obtained ink-receiving layer allows easy and smooth printing of characters or images by ink jet printing.

10 Substrates on which the UV curable coating composition according to the present invention can be coated include general recording media, for example, paper, vinyl, glass, and plastic. In particular, the UV curable coating composition according to the present invention is suitable for optical recording media whose use has been rapidly increasing in recent years. Optical recording media generally  
15 include a substrate, a recording layer, a reflective layer, and a protective layer. The protective layer of optical recording media is formed of a hydrophobic material such as polyester resin, polycarbonate resin, or acrylic resin. For this reason, it is difficult to obtain good print outputs by applying water soluble ink that is used for ink jet printing on the  
20 protective layer of optical recording media. However, when an ink-receiving layer acting as an intermediate layer between the ink and the protective layer of an optical recording medium is formed by coating the UV curable coating composition according to the present invention on the protective layer and radiating UV rays onto the coated  
25 composition, high quality outputs can be printed on the recording medium with water soluble ink used for ink jet printing.

Adhesion to hydrophobic substrates, water resistance under high-temperature and high-humidity conditions, ink absorption, safe printability, and long-term preservative quality are required for  
30 ink-receiving layers of recording media. An ink-receiving layer

satisfying the requirements above can be formed by using the UV curable coating composition according to the present invention.

#### Best mode for carrying out the Invention

5        The present invention now will be described more fully with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein; rather, these  
10        embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the concept of the invention to those skilled in the art.

#### Example 1

15        A UV curable coating composition containing the following compounds was mixed in a mixer for 1 hour to obtain a coating solution.

	Ethylene glycol monoacrylate	100 parts by weight
	Ethylene glycol monoacrylate oligomer	200 parts by weight
20	N-vinyl-2-pyrrolidone	50 parts by weight
	$\alpha$ -Hydroxyketone	10 parts by weight
	Calcium carbonate	35 parts by weight
	Kaolin	35 parts by weight
	Polymethylurea	70 parts by weight
25	Modified Polyacrylate	20 parts by weight

The obtained coating solution was coated on the protective layer of a commercially available CD-rewritable disc (Gold/Blue CD-R, SKC, Korea) by screen printing and cured by radiating UV rays with a mercury  
30        lamp (UC LIGHT 36/150) to form an ink-receiving layer having a

thickness of about 15  $\mu\text{m}$  on the optical recording medium. Here, the intensity of the UV ramp at the surface of the medium was 2.5 kW.

### Example 2

5 A UV curable coating composition containing the following compounds was mixed in a mixer for 1 hour to obtain a coating solution.

	Acrylamide	100 parts by weight
	Acrylamide oligomer	200 parts by weight
10	N-vinyl-2-pyrrolidone	70 parts by weight
	$\alpha$ -Hydroxyketone	10 parts by weight
	Calcium carbonate	35 parts by weight
	Kaolin	35 parts by weight
	Polymethylurea	70 parts by weight
15	Modified Polyacrylate	20 parts by weight

The obtained coating solution was coated and polymerized and cured in the same manner as in Example 1 to manufacture a recording medium having an ink-receiving layer.

20

### Example 3

A UV curable coating composition containing the following compounds was mixed in a mixer for 1 hour to obtain a coating solution.

25	Carboxyethyl methacrylate	100 parts by weight
	Carboxyethyl methacrylate oligomer	200 parts by weight
	N-vinyl-2-pyrrolidone	80 parts by weight
	$\alpha$ -Hydroxyketone	10 parts by weight
	Calcium carbonate	35 parts by weight

Kaolin	35 parts by weight
Polymethylurea	70 parts by weight
Modified Polyacrylate	20 parts by weight

- 5        The obtained coating solution was coated and polymerized and cured in the same manner as in Example 1 to manufacture a recording medium having an ink-receiving layer.

#### Comparative Example 1

- 10       A UV curable coating composition containing the following compounds was mixed in a mixer for 1 hour to obtain a coating solution.

	Carboxyethyl methacrylate	100 parts by weight
	$\alpha$ -Hydroxyketone	20 parts by weight
15	Calcium carbonate	50 parts by weight
	Kaolin	50 parts by weight
	Polymethylurea	30 parts by weight
	Modified Polyacrylate	10 parts by weight

- 20       The obtained coating solution was coated and polymerized and cured in the same manner as in Example 1 to manufacture a recording medium having an ink-receiving layer.

#### Comparative Example 2

- 25       A UV curable coating composition containing the following compounds was mixed in a mixer for 1 hour to obtain a coating solution.

	Carboxyethyl methacrylate	100 parts by weight
	Carboxyethyl methacrylate oligomer	100 parts by weight
30	$\alpha$ -Hydroxyketone	20 parts by weight

Calcium carbonate	50 parts by weight
Kaolin	50 parts by weight
Polymethylurea	70 parts by weight
Modified Polyacrylate	20 parts by weight

5

The obtained coating solution was coated and polymerized and cured in the same manner as in Example 1 to manufacture a recording medium having an ink-receiving layer.

10      Experimental Example 1: Determination of Surface Characteristics

Characters and images were printed on the surface of the respective optical recording media having the ink-receiving layer, which had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, 15 the printed characters and images were rubbed using fingers to determine the surface characteristics of the optical recording media according to the following criteria. The results are shown in Table 1.

- 20      ◎ : fairly smooth and not sticky  
         ○ : smooth and not sticky  
         △ : smooth but sticky  
         × : rough and sticky

Experimental Example 2: Determination of Ink Absorption

25      Characters and images were printed on the surface of the respective optical recording media having the ink-receiving layer, which had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, the printed characters and images were observed using a microscope to

determine the ink absorption of the optical recording media according to the following criteria. The results are shown in Table 1.

- ◎ : no bleeding of ink on the surface
- : bleeding of ink on the surface within 0.4 mm or less
- △ : bleeding of ink on the surface within the range of 0.4-0.8 mm
- × : bleeding of ink on the surface for 0.8 mm or greater

#### Example 3: Determination of Drying Rate

Characters and images were printed on the surface of the respective optical recording media having the ink-receiving layer, which had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, the printed characters and images were hand-touched to determine the point of time at which the hands were not stained with undried ink according to the following criteria. The results are shown in Table. 1.

- ◎ : ink dried within 30 seconds
- : ink dried within 30 seconds to 2 minutes
- △ : ink dried within 2-10 minutes
- × : ink was not dried within 10 minutes

#### Experimental Example 4: Determination of Water Resistance

Characters and images were printed on the surface of the respective optical recording media having the ink-receiving layer, which had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, water was flowed for 1 hour over the surface of the respective recording media on which the characters and images had been printed. Changes

in the concentration of the printed characters or images were observed to determine water resistance according to the following criteria. The results are shown in Table 1.

- 5           ⊙ : not changed  
          Δ : changed slightly  
          × : changed greatly

#### Experimental Example 5: Determination of Print Quality

- 10           Stripes of a variety of colors were printed on the surface of the respective optical recording media having the ink-receiving layer, which had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, the surfaces of the optical recording media on which the stripes had  
15           been printed were observed to determine print quality according to the following criteria. The results are shown in Table 1.

- ⊙ : color of the stripes was uniform  
          Δ : color of the stripes was slightly nonuniform  
20           × : color of the stripes was greatly nonuniform

#### Experimental Example 6: Determination of Preservative Quality

- Characters and images were printed on the surface of the respective optical recording media having the ink-receiving layer, which  
25           had been manufactured in Examples 1 through 3 and Comparative Examples 1 and 2, using a color printer (Signature II, Primera). Then, the recording media were left at 30°C and 80% relative humidity (RH) for 20 days, and the surfaces of the recording media on which the characters and images had been printed were observed to determine

preservative quality according to the following criteria.

⊙ : print quality did not changed

Δ : print quality changed slightly

5      × : print quality changed greatly

#### Experimental Example 7: Determination of Adhesion to Substrate

Adhesion of the ink-receiving layers to the surfaces of the respective recording media, which had been manufactured in Examples 10      1 through 3 and Comparative Examples 1 and 2, was examined by determine whether the ink-receiving layer separated from the respective recording media according to the following criteria. The results are shown in Table 1.

15      ⊙ : not separated

Δ : separated slightly

× : separated greatly

Table 1

Characteristic	Example 1	Example 2	Example 3	Comparative Example 1	Comparative Example 2
Surface Characteristics	⊙	⊙	⊙	Δ	×
Ink Absorption	⊙	⊙	⊙	Δ	⊙
Drying Rate	⊙	○	○	○	○
Water Resistance	⊙	⊙	⊙	×	Δ
Print Quality	⊙	⊙	⊙	Δ	Δ
Preservative Quality	⊙	Δ	⊙	×	×



Adhesion to Substrate	⊙	⊙	⊙	⊙	⊙
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#### Industrial Applicability

As shown in Table 2, when an ink-receiving layer is formed on a recording medium using the UV curable coating composition according to the present invention, adhesion to a substrate, absorption and adsorption of water soluble ink used for ink printing, drying efficiency, and water resistance are improved so that the recording medium has excellent print quality.

What is claimed is:

1. A UV curable coating composition comprising:  
100 parts by weight a (meth)acrylate monomer;  
150-250 parts by weight a (meth)acrylate oligomer;  
5 10-100 parts by weight N-vinyl-2-pyrrolidone.
2. The UV curable coating composition of claim 1, wherein  
the (meth)acrylate monomer is at least one selected from the group  
consisting of alkyl(meth)acrylate, (meth)acrylic acid, (meth)acrylonitrile,  
10 (meth)acrylamide, N-substituted (meth)acrylamide,  
N-methylol(meth)acrylamide, hydroxyethyl(meth)acrylate,  
carboxyethyl(meth)acrylate, (meth)acryloylmorpholine, ethylene glycol  
mono(meth)acrylate, diethylene glycol mono(meth)acrylate, polyethylene  
glycol mono(meth)acrylate, dimethylaminopropyl(meth)acrylamide,  
15 tetrahydrofurfuryl(meth)acrylate, ethylene glycol di(meth)acrylate,  
diethylene glycol di(meth)acrylate, polyethylene glycol di(meth)acrylate,  
1,6-hexane glycol di(meth)acrylate, pentaerythritol tetra(meth)acrylate,  
pentaerythritol (meth)acrylate, trimethylolpropane tri(meth)acrylate, and  
trimethylolpropane di(meth)acrylate.
- 20 3. The UV curable coating composition of claim 2, wherein  
the (meth)acrylate monomer is at least one selected from the group  
consisting of alkyl(meth)acrylate, hydroxyethyl(meth)acrylate,  
carboxyethyl(meth)acrylate, diethylene glycol mono(meth)acrylate,  
25 ethylene glycol mono(meth)acrylate, tetrahydrofurfuryl(meth)acrylate,  
and polyethylene glycol di(meth)acrylate.
4. The UV curable coating composition of claim 1, wherein  
the (meth)acrylate oligomer is at least one selected from the group  
30 consisting of alkyl(meth)acrylate oligomer, (meth)acrylic acid oligomer,

(meth)acrylonitrile oligomer, (meth)acrylamide oligomer, N-substituted (meth)acrylamide oligomer, N-methylol(meth)acrylamide oligomer, hydroxyethyl(meth)acrylate oligomer, carboxyethyl(meth)acrylate oligomer, (meth)acryloylmorpholine oligomer, ethylene glycol mono(meth)acrylate oligomer, diethylene glycol mono(meth)acrylate oligomer, polyethylene glycol mono(meth)acrylate oligomer, dimethylaminopropyl(meth)acrylamide oligomer, tetrahydrofurfuryl(meth)acrylate oligomer, ethylene glycol di(meth)acrylate oligomer, diethylene glycol di(meth)acrylate oligomer, polyethylene glycol di(meth)acrylate oligomer, 1,6-hexane glycol di(meth)acrylate oligomer, pentaerythritol tetra(meth)acrylate oligomer, pentaerythritol (meth)acrylate oligomer, trimethylolpropane tri(meth)acrylate oligomer, and trimethylolpropane di(meth)acrylate oligomer.

5. The UV curable coating composition of claim 1, wherein the (meth)acrylate oligomer is at least one selected from the group consisting of alkyl(meth)acrylate oligomer, hydroxyethyl(meth)acrylate oligomer, carboxyethyl(meth)acrylate oligomer, diethylene glycol mono(meth)acrylate oligomer, ethylene glycol mono(meth)acrylate oligomer, tetrahydrofurfuryl(meth)acrylate, and polyethylene glycol mono(meth)acrylate.

6. The UV curable coating composition of claim 1, further comprising 30-150 parts by weight an inorganic pigment based on 100 parts by weight the (meth)acrylate monomer.

7. The UV curable coating composition of claim 6, wherein the inorganic pigment is at least one selected from the group consisting of alumina, silica gel, silica-alumina, talc, diatomaceous earth, calcium carbonate, calcium sulfate, zeolite, kaolin, barium sulfate, titanium

dioxide, zinc oxide, zinc sulfate, zinc carbonate, saturn white, aluminum silicate, calcium silicate, magnesium silicate, synthetic amorphous silica, colloidal silica, colloidal alumina, pseudoboehmite, aluminum hydroxide, lithopone, magnesium carbonate, and magnesium hydroxide.

5

8. The UV curable coating composition of claim 7, wherein the inorganic pigment is calcium carbonate, kaolin, or a mixture of these materials.

10

9. The UV curable coating composition of claim 1, further comprising 50-150 parts by weight an organic pigment based on 100 parts by weight the (meth)acrylate monomer.

15

10. The UV curable coating composition of claim 9, wherein the organic pigment is at least one selected from the group consisting of styrene-based plastic pigment, acrylic plastic pigment, polyethylene, microcapsule, urea resin, and melamine resin.

20

11. The UV curable coating composition of claim 10, wherein the organic pigment is urea resin.

12. The UV curable coating composition of claim 11, wherein the organic pigment is polymethylene urea.

25

13. The UV curable coating composition of claim 1, further comprising 30-150 parts by weight an inorganic pigment and 50-150 parts by weight an organic pigment, based on 100 parts by weight the (meth)acrylate monomer.

30

14. The UV curable coating composition of claim 13, wherein

the inorganic pigment is at least one selected from the group consisting of alumina, silica gel, silica-alumina, talc, diatomaceous earth, calcium carbonate, calcium sulfate, zeolite, kaolin, barium sulfate, titanium dioxide, zinc oxide, zinc sulfate, zinc carbonate, saturn white, aluminum silicate, calcium silicate, magnesium silicate, synthetic amorphous silica, colloidal silica, colloidal alumina, pseudoboehmite, aluminum hydroxide, lithopone, magnesium carbonate, and magnesium hydroxide, and the organic pigment is at least one selected from the group consisting of styrene-based plastic pigment, acrylic plastic pigment, polyethylene, microcapsule, urea resin, and melamine resin.

15           15.    The UV curable coating composition of claim 14, wherein the inorganic pigment is calcium carbonate, kaolin, or a mixture of these materials, and the organic pigment is urea resin.

              16.    The UV curable coating composition of claim 1, further comprising 5-50 parts by weight a surfactant or a dispersing agent based on 100 parts by weight the (meth)acrylate.

20           17.    An optical recording medium comprising an ink-receiving layer on at least one surface of a hydrophobic substrate, the ink-receiving layer formed by polymerizing and curing the UV curable coating composition of any of claims 1 through 16.

25           18.    An optical recording medium comprising an ink-receiving layer on an opposite surface of the optical recording medium to a surface on which optical reading/writing is performed, the ink-receiving layer formed by polymerizing and curing the UV curable coating composition of any of claims 1 through 16.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR01/01427

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C09D 133/10, C09D 11/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 C09D 133/10, C09D 11/00, C09D 4/02, C08F 220/00,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975

Korean Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NPS, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 11100527 A (TDK CO) 13, April, 1999 - see the whole document -	1-18
Y	KR 1998-076837 A (CANON CO) 16, November, 1998 - see the whole document -	1-18
Y	KR 2000-0021807 A (SKC CO) 25, April, 2000 - see the whole document -	1-18
Y	KR 2000-0021806 A (SKC CO) 25, April, 2000 - see the whole document -	1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

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KR 2000-0021806 A	25, 04, 2000	NONE	